Momentum as an Investment Strategy in the Indian Stock Market-an Evaluative Study

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Abstract: The Indian Stock market has witnessed a major transformation and structural change from the 10 to 15 years as a result of the ongoing economic and financial sector reforms initiated by the government of India since 1991. Among these measures, lifting of barriers and opening up the doors for foreign investors have promoted integration of Indian markets with other foreign markets, especially other emerging countries.

The Efficient Market Hypothesis (EMH) (Fama, 1970) suggests that prices are theoretically unpredictable and therefore there is no extra profit existing in the market. However in the real world situation EMH is strongly challenged by many financial anomalies. Many studies conducted by academicians and practitioners have recognised that average stock returns are related to past performance and the stock returns are predictable based on past returns. Momentum strategy believes that stocks which have performed well in past will be doing so, also in the future. It buys stocks with good historical performance and sells stocks which have done worse.

The aim of this study is to evaluate **Momentum as an Investment Strategy**, its profitability in Indian stock market and reasons explaining their existence in the current market trends.

Key Words: Indian Stock Market, Momentum Strategy, Emerging Markets, Nifty Index Movements.

INTRODUCTION

The Efficient Market Hypothesis (EMH) (Fama, 1970) always refers to the state of unpredictability in share prices and the resultant fact that no abnormal profits can be earned in the existing market conditions. However in the real world situation EMH is strongly challenged by many financial anomalies. Many studies conducted in the similar area have proved on the predictability of stock prices based on past returns. There are cases where past losers (negative or lowest return-stocks) outperform past winners. De Bondt and Thaler (1985) document those stocks with extreme capital losses in the past; the so-called losers will outperform those with extreme capital

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gains, the so-called winners in the future 3-5 years. Jegadeesh and Titman (1993) also finds that stocks that perform the best (worst) over a 3 to 12 months period tend to continue to perform well (poorly) over the subsequent 3 to 12 months.

Many studies like (Barberish, Shleifer & Vishny, 1998) also concluded with the opinion that when return autocorrelations are positive and statistically significant, investors could generate positive and significant profits by using the Momentum strategy. If return autocorrelations are negative and statistically significant, investors could earn profits by using the Contrarian strategy (Daniel, Hirshleifer & Subramahnyam, 1998). Thus, the variance ratio may also suggest that there exists profit opportunities for Contrarian and Momentum strategies (Pan, Liano, & Huang, 2004).

Momentum is an investment strategy which tries to make *excess returns* by investigating historical price or stock return data in order to forecast the future trend of stock performance. In this strategy it is believed that stocks which have performed well in past will be doing so, also in the future. It buys stocks with good historical performance and sells stocks which have done worse. (Figure 1)

The empirical evidence of success of this strategy is very strong and extensive, and the results have created a lot of interest in this area among institutional investors. For example, the Momentum Strategy has become a widely used investment strategy in many funds and other investments.

Figure 1: Momentum Strategy
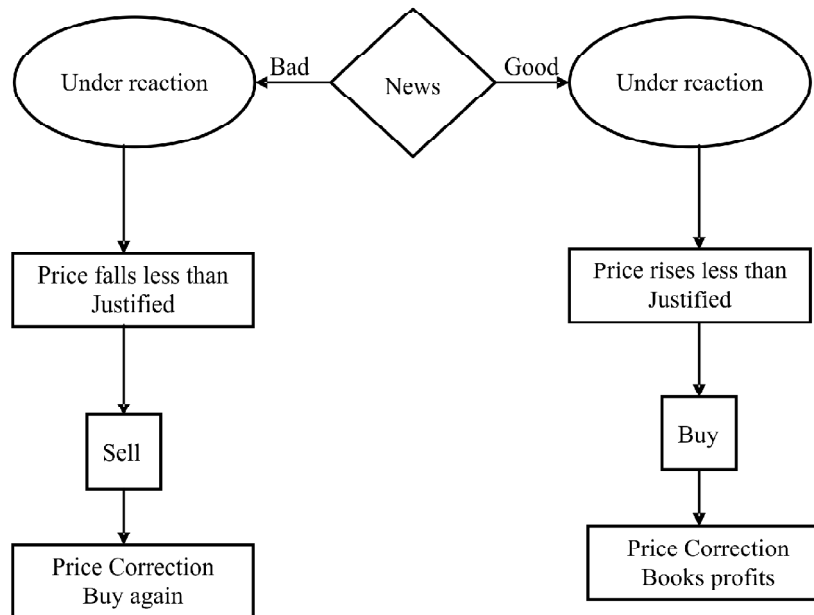
Source: Narasimhan M, Agarwal and Jain, (2004), "An Analysis of Contrarian and Momentum Strategies in Indian Stock Market", NIBM, Vol: XXIII, No.1

Numbers of studies have been conducted to test the effectiveness of this strategy in earning superior returns and for determining the factors of its profitability.

The first main work where Momentum strategy is considered is Jegadeesh and Titman (1993). Many researchers like Chan *et al.* (1996 and 1999), Rouwenhorst (1998 and 1999), Conrad and Kaul (1998), Moskowitz and Grinblatt (1999), Hong *et al.* (2000), Griffin *et al.* (2003), and Avramov and Chordia (2006) studied about the possibility of making profits by using Momentum strategy.

The evidence that Momentum Strategy can earn abnormal returns is very strong. However, the reasons behind the success of this strategy are still very controversial. The aim of this study is to demonstrate the Momentum Investment strategy, their profitability in Indian stock market and reasons explaining their existence in the current perspective where the market has become pretty unpredictable.

SAMPLE AND METHODOLOGY

The methodology adopted by researcher is similar to the one which is adopted in studies like Narasimhan, Agarwal and Jain (2005), Moskowitz and Grinblatt (1999) and many other studies both in Indian markets and other Emerging markets.

Steps involved in the formation and evaluation of portfolios for studying Momentum Strategy are as follows:

1. Mean of daily returns of stocks for the formation period was taken and then ranked them in the descending order. For this study the formation period was one month. Based on the ranking, a portfolio was formed comprising of top seven stocks called as winner portfolio.

2. The daily returns of the portfolio over the next H-week holding period were computed. H takes the value of 2 to 8 weeks.

3. Momentum returns are calculated as the mean of the daily returns arising from the winner portfolio for the holding period i.e H value

4. The performance of Momentum is evaluated by comparing with the daily index returns during respective periods.

5. The portfolio formation and evaluation process is repeated for the years 2006-2011 with formation period of one month and holding period of 2,3,4,5,6,7 and 8 weeks respectively.

6. To study the profitability of Momentum strategy for various formations and holding periods, t-test was used. It was used to find out whether Momentum strategy yield significant positive returns when compared with the bench mark, i.e. index return.

First step of the researcher for testing the effectiveness of the investment strategy namely Momentum was to establish the entire study period in to various formation periods of one month each, by taking daily returns. Daily returns of the shares included in the construction of Nifty index and whose data which was available for

the whole 6 years were taken for the study. So the sample size was 29 companies shares, the results of which are given in the following tables. Mean of daily returns had been taken for the study.

ANALYSIS OF MOMENTUM AS AN INVESTMENT STRATEGY

This section is divided in to three parts. First part explains the construction of formation period and the selection of the winning portfolio and loser Portfolio. Next part of this section discusses on the formation of holding periods out of the portfolio constructed and the computation of average returns. Average returns of winner portfolios are being compared .Index returns are calculated to provide a benchmark for all these comparisons.Researcher also employed T-test to compute the level of significance of mean returns.

A sample of the results of the tests is given below. Remaining results are kept in the Appendix which can be used for reference.

Table 1 Returns in Formation Period for 29 companies (Jan 2006)		Table 2 Returns in Formation Period for 29 companies (April 2006)	
Company	*Average Return*	*Company*	*Average Return*
TATA POWER	0.00853	UNITECH	0.00854
MARUTI	0.00825	CIPLA	0.00835
TATA MOTORS	0.00779	WIPRO	0.00680
GRASIM	0.00507	GRASIM	0.00678
PNB	0.00455	SUN PHARMA	0.00589
SBIN	0.00349	PNB	0.00573
M & M	0.00282	HCL	0.00466
ITC	0.00181	ACC	0.00385
SUN PHARMA	0.00138	RANBAXY	0.00378
ABB	0.00082	MARUTI	0.00303
BHEL	0.00065	RELCAPITEL	0.00268
HDFC	0.00036	ICICI BANK	0.00263
RELCAPITEL	0.00000	SIEMENS	0.00230
ACC	-0.00002	SBIN	0.00213
HERO HONDA	-0.00018	SAIL	0.00159
RELIANCE	-0.00063	JINDAL	0.00124
HCL	-0.00069	INFOSYS	0.00065
ICICI BANK	-0.00094	ONGL	0.00063
UNITECH	-0.00182	GAIL	0.00027
HDFC BANK	-0.00292	ABB	0.00013
INFOSYS	-0.00361	ITC	-0.00027
ONGL	-0.00408	TATA POWER	-0.00031
RANBAXY	-0.00512	M & M	-0.00070
CIPLA	-0.00558	HDFC BANK	-0.00083
WIPRO	-0.00580	HERO HONDA	-0.00203
SAIL	-0.00700	TATA MOTORS	-0.00213
GAIL	-0.00813	RELIANCE	-0.00271
SIEMENS	-0.00852	BHEL	-0.00422
JINDAL	-0.01047	HDFC	-0.00558

Source: Computed from data source   *Source: Computed from data source*

The formation and evaluation process was repeated for the years 2006-2011 with formation period of one month.(Table 1 to 22) .Based on the results of the formation period the 29 companies were ranked accordingly. a portfolio was formed in terms of average reruns comprising of top seven stocks called as winner portfolio. Researcher had arranged the mean returns in descending order.

Top seven companies in the formation period data given in (Table 1 to 22) was the ones which were included in winning portfolio construction.

The study was conducted taking different holding periods and holding periods were 2, 3, 4, 5, 6, 7 and 8 weeks respectively. This was to test the possibility of variation in profit potential of the investment strategy with time.

Below given is a sample of the work done by the researcher for computing momentum returns. In the example given here the holding period is two weeks. Average returns using the strategy was compared with the average Index return. Average returns in two-week holding period were calculated by taking the average returns of 89 different holding periods the details of which is given in Table 3.

Table 3
Returns of Momentum Portfolios compared with index return for 2-Week Holding Period

Period	Average Momentum Return	Average Index Return
03-Feb-04 To 16-Feb-04	0.00894	0.00571
17-Feb-04 To 27-Feb-04	-0.00827	-0.00664
01-Mar-04 To 16-Mar-04	-0.00056	-0.00249
17-Mar-04 To 31-Mar-04	0.00640	0.00125
03-May-04 To 14-May-04	0.01895	-0.01221
17-May-04 To 31-May-04	-0.00571	-0.00456
01-Jun-04 To 15-Jun-04	-0.01260	0.00119
16-Jun-04 To 30-Jun-04	-0.00726	0.00035
02-Aug-04 To 16-Aug-04	-0.00052	-0.00182
17-Aug-04 To 31-Aug-04	0.00023	0.00188
01-Sep-04 To 15-Sep-04	0.00366	0.00284
16-Sep-04 To 30-Sep-04	0.00734	0.00337
01-Nov-04 To 12-Nov-04	0.00583	0.00473
16-Nov-04 To 30-Nov-04	0.00980	0.00452
01-Dec-04 To 15-Dec-04	0.00404	0.00323
16-Dec-04 To 31-Dec-04	0.00423	0.00212
01-Feb-05 To 14-Feb-05	0.00443	0.00198
15-Feb-05 To 28-Feb-05	0.00202	0.00027
01-Mar-05 To 15-Mar-05	0.00121	0.00113
16-Mar-05 To 31-Mar-05	-0.00201	-0.00399
02-May-05 To 16-May-05	0.00743	0.00515

contd. table 3

Period	Average Momentum Return	Average Index Return
17-May-05 To 31-May-05	0.00315	0.00335
01-Jun-05 To 14-Jun-05	0.00154	0.00110
15-Jun-05 To 30-Jun-05	0.00404	0.00420
01-Aug-05 To 16-Aug-05	0.00283	0.00228
17-Aug-05 To 31-Aug-05	-0.00078	0.00062
01-Sep-05 To 15-Sep-05	0.00133	0.00571
16-Sep-05 To 30-Sep-05	0.00398	0.00287
01-Nov-05 To 17-Nov-05	0.00811	0.00944
18-Nov-05 To 30-Nov-05	0.00464	0.00189
01-Dec-05 To 15-Dec-05	0.00468	0.00429
16-Dec-05 To 30-Dec-05	0.00398	0.00194
01-Feb-06 To 15-Feb-06	-0.00061	0.00074
16-Feb-06 To 28-Feb-06	0.00464	0.00194
01-Mar-06 To 16-Mar-06	0.01113	0.00445
17-Mar-06 To 31-Mar-06	0.00480	0.00487
02-May-06 To 16-May-06	0.00383	-0.00076
17-May-06 To 31-May-06	-0.00563	-0.01184
01-Jun-06 To 15-Jun-06	0.01161	-0.00768
16-Jun-06 To 30-Jun-06	0.00273	0.00953
01-Aug-06 To 16-Aug-06	0.00628	0.00601
17-Aug-06 To 31-Aug-06	0.00383	0.00157
01-Sep-06 To 14-Sep-06	0.00451	0.00176
15-Sep-06 To 29-Sep-06	0.00444	0.00304
01-Nov-06 To 15-Nov-06	0.00529	0.00317
16-Nov-06 To 30-Nov-06	-0.00044	0.00184
01-Dec-06 To 14-Dec-06	0.00060	-0.00271
15-Dec-06 To 29-Dec-06	0.00277	0.00323
01-Feb-07 To 14-Feb-07	-0.00021	-0.00080
15-Feb-07 To 28-Feb-07	-0.00509	-0.00843
01-Mar-07 To 14-Mar-07	-0.00189	-0.00253
15-Mar-07 To 30-Mar-07	0.00686	0.00450
03-May-07 To 16-May-07	0.00362	0.00205
17-May-07 To 31-May-07	0.00143	0.00272
01-Jun-07 To 14-Jun-07	-0.00121	-0.00293
15-Jun-07 To 29-Jun-07	-0.00368	0.00320
01-Aug-07 To 16-Aug-07	-0.00650	-0.00709
17-Aug-07 To 31-Aug-07	0.00932	0.00618
03-Sep-07 To 14-Sep-07	0.00591	0.00121

contd. table 3

Period	Average Momentum Return	Average Index Return
17-Sep-07 To 28-Sep-07	0.01045	0.01070
01-Nov-07 To 15-Nov-07	0.00086	0.00030
16-Nov-07 To 30-Nov-07	0.00006	-0.00217
03-Dec-07 To 14-Dec-07	0.00971	0.00490
17-Dec-07 To 31-Dec-07	0.00231	0.00187
01-Feb-08 To 14-Feb-08	0.00108	0.00176
15-Feb-08 To 29-Feb-08	-0.00065	0.00046
03-Mar-08 To 14-Mar-08	-0.01175	-0.01023
17-Mar-08 To 31-Mar-08	-0.00216	0.00021
02-May-08 To 15-May-08	-0.00121	-0.00091
16-May-08 To 30-May-08	-0.00315	-0.00484
02-Jun-08 To 13-Jun-08	-0.00483	-0.00736
16-Jun-08 To 30-Jun-08	-0.00994	-0.00988
01-Aug-08 To 14-Aug-08	0.00099	0.00233
18-Aug-08 To 29-Aug-08	0.00087	-0.00147
01-Sep-08 To 15-Sep-08	-0.00842	-0.00655
16-Sep-08 To 30-Sep-08	-0.00445	-0.00317
03-Nov-08 To 14-Nov-08	-0.00495	-0.00198
17-Nov-08 To 28-Nov-08	0.00035	-0.00177
01-Dec-08 To 15-Dec-08	-0.00368	0.00826
16-Dec-08 To 31-Dec-08	0.00286	-0.00045
02-Feb-09 To 13-Feb-09	0.00334	0.00269
16-Feb-09 To 27-Feb-09	-0.01181	-0.00705
02-Mar-09 To 17-Mar-09	0.00267	0.00003
18-Mar-09 To 31-Mar-09	0.01192	0.00941
04-May-09 To 15-May-09	0.01086	0.00579
18-May-09 To 29-May-09	0.02608	0.02079
01-Jun-09 To 15-Jun-09	0.00773	0.00087
16-Jun-09 To 30-Jun-09	-0.00607	-0.00380

Source: Computed from data source

In two week holding period the researcher had repeated the process of computation of holding periods and evaluation of winning and looser portfolio returns for more than 89 times, the final results of which by taking the mean portfolio returns are put in the table given above (Table 3).

The whole process can be explained by taking the example of January 2006 as the formation period and the next two months i.e February and March as the holding periods. During this period the winner portfolio consisted of 7 companies, the results of which are given in the following table (Table 4).

Table 4
Winner Portfolio Returns from February 2006 to March 2006

Date	TATAP	MARUTI	TATAM	GRASIM	PNB	SBIN	M & M	Average	Index Return
03-Feb-04	-0.05276	-0.05860	-0.02075	-0.00314	-0.07899	-0.05142	0.00623	-0.03706	-0.02252
04-Feb-04	0.06175	0.08882	0.06829	-0.01190	0.01657	0.03940	0.06836	0.04733	0.03007
05-Feb-04	-0.02994	-0.02045	-0.05033	-0.02048	0.03321	-0.01747	0.00159	-0.01484	-0.00971
06-Feb-04	0.02335	0.03495	0.02901	0.00750	0.03234	0.02796	0.00216	0.02247	0.01615
09-Feb-04	0.03750	0.03789	0.01898	0.02902	0.06943	0.04576	0.02853	0.03816	0.02566
10-Feb-04	-0.01106	-0.01074	-0.01457	-0.00364	-0.02333	-0.01879	-0.02576	-0.01541	0.00003
11-Feb-04	0.01119	0.02866	0.01535	0.03939	0.04240	0.02651	0.01243	0.02513	0.00572
12-Feb-04	-0.00141	0.01435	-0.00240	-0.01500	-0.02558	-0.01546	0.03437	-0.00159	-0.00328
13-Feb-04	0.01713	0.02840	0.02366	0.00471	0.00893	0.01870	0.00000	0.01450	0.01501
16-Feb-04	-0.00076	0.05088	0.01128	-0.00044	-0.03577	0.00159	0.04845	0.01075	-0.00003
Average								0.00894	0.00571

Source: Computed from data source

It can be studied from the above table that the results of the average returns of the winner portfolio i.e. one which follows momentum strategy is compared with the index returns for the similar period.

Researcher had also conducted the t-test to study the profitability of momentum for various formations and holding periods. It was to find out whether momentum strategy yield significant positive returns when compared with the bench mark, i.e. index return. The results of the t-tests for various holding periods and formation periods are given in following tables. (Table.5 to 11)

Table 5
T-test for 2-Week Holding Period

Pairs	t	df	P value
Momentum & Index	1.307	174	0.193

Source: Computed from data source

Here the p-value is greater than the significance value 0.05; so the results of two-week holding periods draw towards accepting the null hypotheses (H_0):Momentum Strategy does not give superior returns to the investor in the Indian Capital Market

The results also reject the possibility of making superior returns by adopting the momentum investment strategy for a two-week holding period in the Indian stock market during the study period.

Table 6
T-test for 3-Week Holding Period

Pairs	t	df	P value
Momentum & Index	0.779	120	0.438

Source: Computed from data source

Here the p-value is greater than the significance value 0.05; so the results of three-week holding periods draw towards accepting the null hypotheses (H_0):Momentum Strategy does not give superior returns to the investor in the Indian Capital Market

Table 7
T-test for 4-Week Holding Period

Pairs	t	df	P value
Momentum & Index	0.611	86	0.543

Source: Computed from data source

Here the p-value is greater than the significance value 0.05; so the results of four-week holding periods draw towards accepting the null hypotheses (H_0):Momentum Strategy does not give superior returns to the investor in the Indian Capital Market

Table 8
T-test for 5-Week Holding Period

Pairs	t	df	P value
Momentum & Index	0.608	42	0.547

Source: Computed from data source

Here the p-value is greater than the significance value 0.05; so the results of five-week holding periods draw towards accepting the null hypotheses (H_0):Momentum Strategy does not give superior returns to the investor in the Indian Capital Market

Table 9
T-test for 6-Week Holding Period

Pairs	t	df	P value
Momentum & Index	0.691	42	0.494

Source: Computed from data source

Here the p-value is greater than the significance value 0.05; so the results of six-week holding periods draw towards accepting the null hypotheses (H_0):Momentum Strategy does not give superior returns to the investor in the Indian Capital Market.

Table 10
T-test for 7-Week Holding Period

Pairs	t	df	P value
Momentum & Index	0.749	42	0.458

Source: Computed from data source

Here the p-value is greater than the significance value 0.05; so the results of seven-week holding periods draw towards accepting the null hypotheses (H_0): Momentum Strategy does not give superior returns to the investor in the Indian Capital Market.

Table 11
T-test for 8-Week Holding Period

Pairs	t	df	P value
Momentum & Index	0.561	42	0.578

Source: Computed from data source

Here the p-value is greater than the significance value 0.05; so the results of eight-week holding periods draw towards accepting the null hypotheses (H_0): Momentum Strategy does not give superior returns to the investor in the Indian Capital Market

The study results reveal that there does not appear any merits to the momentum strategy as technical analysis tool in Indian Stock Market. The results are different from many other emerging markets where empirical studies have revealed the possibility of making superior returns using this strategy.

CONCLUSION

Many academicians and practitioners now hold that stock prices do have some degree of predictability. By using the most rigorous and credible methods, it has been recognised that stock returns can deviate from a random walk, which highlights the potential value in technical analysis or more sophisticated statistical forecasting methods. But such studies can no way reject, efficient market hypothesis. Rather, it should be treated as the base case to which alternatives can be compared.

Of course, stock prices contain some predictability. Results of this study also support the weak-form inefficiency of Indian stock-market. So Investors are left with opportunity to make excess return by studying the historical prices, However, this has to be done in a way that it compensates for the transactions costs of trading. The present study reveals that Momentum as an investment strategy does not give superior returns when compared with the bench mark i.e Index return during the study period. Moreover the implementation of this strategy involves huge transaction cost for the constant revision of the portfolio.

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APPENDIX

Table 1 Returns in Formation Period for 29 companies (July 2006)		Table 2 Returns in Formation Period for 29 companies (Oct 2006)	
Company	*Average Return*	*Company*	*Average Return*
SAIL	0.01877	INFOSYS	0.00615
JINDAL	0.01004	UNITECH	0.00553
ITC	0.00781	WIPRO	0.00462
CIPLA	0.00744	JINDAL	0.00457
GAIL	0.00626	BHEL	0.00356
RELIANCE	0.00536	MARUTI	0.00292
TATA POWER	0.00484	SUN PHARMA	0.00281
INFOSYS	0.00478	SAIL	0.00270
HDFC	0.00422	SIEMENS	0.00192
TATA MOTORS	0.00422	ICICI BANK	0.00184
ICICI BANK	0.00386	HDFC	0.00124
ONGL	0.00379	ONGL	0.00088
MARUTI	0.00246	HDFC BANK	0.00061
BHEL	0.00244	M & M	0.00054
SIEMENS	0.00204	ABB	0.00031
HCL	0.00204	GAIL	0.00014
UNITECH	0.00142	TATA MOTORS	0.00010
RANBAXY	0.00128	RANBAXY	0.00006
WIPRO	0.00112	RELIANCE	-0.00028
ABB	0.00080	HCL	-0.00096
M & M	0.00064	ITC	-0.00191
HDFC BANK	0.00050	TATA POWER	-0.00301
RELCAPITEL	0.00046	CIPLA	-0.00326
SBIN	0.00020	GRASIM	-0.00338
ACC	-0.00083	PNB	-0.00338
SUN PHARMA	-0.00153	SBIN	-0.00343
PNB	-0.00185	HERO HONDA	-0.00354
GRASIM	-0.00246	ACC	-0.00358
HERO HONDA	-0.00734	RELCAPITEL	-0.00446

Source: Computed from data source   *Source:* Computed from data source

Table 3 Returns in Formation Period for 29 companies (Jan 2007)		Table 4 Returns in Formation Period for 29 companies (Apr 2007)	
Company	*Average Return*	*Company*	*Average Return*
HDFC BANK	0.00440	UNITECH	0.00430
ACC	0.00286	SUN PHARMA	0.00392
ITC	0.00243	SIEMENS	0.00367
SIEMENS	0.00171	ITC	0.00330
RELCAPITEL	0.00154	CIPLA	0.00123
SAIL	0.00140	HDFC	0.00120
HDFC	0.00097	ABB	0.00024
ABB	0.00046	ACC	-0.00043
GRASIM	0.00027	BHEL	-0.00049
PNB	-0.00035	HDFC BANK	-0.00143
SBIN	-0.00071	TATA MOTORS	-0.00220
ONGL	-0.00076	TATA POWER	-0.00221
RELIANCE	-0.00108	MARUTI	-0.00285
INFOSYS	-0.00114	GRASIM	-0.00285
TATA POWER	-0.00131	WIPRO	-0.00303
M & M	-0.00138	RELIANCE	-0.00337
ICICI BANK	-0.00138	GAIL	-0.00365
TATA MOTORS	-0.00151	HERO HONDA	-0.00385
MARUTI	-0.00155	ONGL	-0.00420
JINDAL	-0.00208	RANBAXY	-0.00545
UNITECH	-0.00272	JINDAL	-0.00549
BHEL	-0.00284	ICICI BANK	-0.00595
HCL	-0.00290	HCL	-0.00683
WIPRO	-0.00341	M & M	-0.00686
GAIL	-0.00419	SBIN	-0.00703
CIPLA	-0.00550	PNB	-0.00707
HERO HONDA	-0.00571	RELCAPITEL	-0.00750
SUN PHARMA	-0.00588	INFOSYS	-0.00868
RANBAXY	-0.00755	SAIL	-0.01001

Source: Computed from data source   *Source:* Computed from data source

Table 5 Returns in Formation Period for 29 companies (Jul 2007)		Table 6 Returns in Formation Period for 29 companies (Oct 2007)	
Company	*Average Return*	*Company*	*Average Return*
ICICI BANK	0.01302	INFOSYS	-0.00047
M & M	0.00936	ABB	-0.00099
BHEL	0.00865	UNITECH	-0.00121
JINDAL	0.00814	WIPRO	-0.00187
UNITECH	0.00712	RELIANCE	-0.00203
SBIN	0.00672	MARUTI	-0.00230
HDFC BANK	0.00668	HDFC	-0.00256
TATA MOTORS	0.00630	HERO HONDA	-0.00260
ACC	0.00594	CIPLA	-0.00397
RELCAPITEL	0.00590	SIEMENS	-0.00408
GRASIM	0.00556	M & M	-0.00412
PNB	0.00517	SUN PHARMA	-0.00423
ABB	0.00513	RELCAPITEL	-0.00451
RELIANCE	0.00512	BHEL	-0.00468
SAIL	0.00491	ACC	-0.00500
SIEMENS	0.00381	HCL	-0.00556
HERO HONDA	0.00365	HDFC BANK	-0.00559
HDFC	0.00341	SBIN	-0.00596
SUN PHARMA	0.00310	PNB	-0.00599
CIPLA	0.00293	ITC	-0.00656
HCL	0.00173	ONGL	-0.00736
MARUTI	0.00130	TATA MOTORS	-0.00806
TATA POWER	0.00123	GRASIM	-0.00870
GAIL	0.00082	ICICI BANK	-0.00882
ITC	0.00047	GAIL	-0.00917
WIPRO	-0.00050	TATA POWER	-0.00988
INFOSYS	-0.00170	JINDAL	-0.01079
ONGL	-0.00230	SAIL	-0.01280
RANBAXY	-0.03262	RANBAXY	-0.01801

Source: Computed from data source   *Source:* Computed from data source

Table 7 Returns in Formation Period for 29 companies (Jan 2008)		Table 8 Returns in Formation Period for 29 companies (Apr 2008)	
Company	*Average Return*	*Company*	*Average Return*
UNITECH	0.02116	UNITECH	0.04390
ABB	0.01495	ACC	0.01477
BHEL	0.01372	RELIANCE	0.01273
SIEMENS	0.01163	GRASIM	0.01007
MARUTI	0.00880	RELCAPITEL	0.00555
HCL	0.00811	RANBAXY	0.00453
WIPRO	0.00754	HDFC BANK	0.00410
HDFC	0.00648	BHEL	0.00162
TATA MOTORS	0.00558	ITC	0.00150
ITC	0.00538	MARUTI	0.00145
GAIL	0.00536	ABB	0.00119
M & M	0.00516	INFOSYS	0.00098
RANBAXY	0.00496	SUN PHARMA	0.00013
RELCAPITEL	0.00463	SAIL	0.00012
TATA POWER	0.00445	ONGL	0.00001
ACC	0.00428	TATA MOTORS	-0.00089
HDFC BANK	0.00365	M & M	-0.00090
GRASIM	0.00306	ICICI BANK	-0.00098
SAIL	0.00272	HDFC	-0.00114
ONGL	0.00212	JINDAL	-0.00134
ICICI BANK	0.00123	WIPRO	-0.00196
SUN PHARMA	0.00109	SIEMENS	-0.00245
HERO HONDA	0.00080	HERO HONDA	-0.00317
CIPLA	0.00031	TATA POWER	-0.00318
JINDAL	-0.00001	SBIN	-0.00421
PNB	-0.00060	PNB	-0.00427
SBIN	-0.00096	GAIL	-0.00538
INFOSYS	-0.00160	HCL	-0.00776
RELIANCE	-0.00986	CIPLA	-0.03749

Source: Computed from data source   *Source:* Computed from data source

Table 9 **Returns in Formation Period for** **29 companies (Jul 2008)**		**Table 10** **Returns in Formation Period for** **29 companies (Oct 2008)**	
Company	*Average Return*	*Company*	*Average Return*
PNB	0.00857	ABB	0.01063
ICICI BANK	0.00655	INFOSYS	0.00763
CIPLA	0.00497	SIEMENS	0.00736
GRASIM	0.00495	M & M	0.00726
SBIN	0.00462	UNITECH	0.00644
ACC	0.00406	HCL	0.00635
SUN PHARMA	0.00319	ICICI BANK	0.00587
BHEL	0.00272	SAIL	0.00560
JINDAL	0.00257	HDFC BANK	0.00501
RANBAXY	0.00248	GRASIM	0.00463
HDFC	0.00235	SBIN	0.00321
ONGL	0.00225	RELIANCE	0.00293
HCL	0.00167	JINDAL	0.00291
HDFC BANK	0.00130	WIPRO	0.00204
TATA POWER	0.00094	CIPLA	0.00130
MARUTI	-0.00003	BHEL	0.00121
SIEMENS	-0.00049	RELCAPITEL	0.00073
WIPRO	-0.00070	ITC	0.00070
ABB	-0.00115	MARUTI	0.00002
M & M	-0.00178	HDFC	-0.00040
GAIL	-0.00201	PNB	-0.00056
TATA MOTORS	-0.00258	HERO HONDA	-0.00094
RELIANCE	-0.00426	ACC	-0.00127
ITC	-0.00470	GAIL	-0.00140
UNITECH	-0.00488	TATA POWER	-0.00150
HERO HONDA	-0.00549	SUN PHARMA	-0.00165
SAIL	-0.00722	TATA MOTORS	-0.00247
RELCAPITEL	-0.00804	RANBAXY	-0.00360
INFOSYS	-0.02214	ONGL	-0.01509

Source: Computed from data source   *Source:* Computed from data source

Table 11 Returns in Formation Period for 29 companies (Jan 2009)		Table 12 Returns in Formation Period for 29 companies (Apr2009)	
Company	Average Return	Company	Average Return
SAIL	0.00986	JINDAL	0.01379
BHEL	0.00501	HCL	0.01118
TATA POWER	0.00371	SAIL	0.01045
RELIANCE	0.00348	ABB	0.00980
GAIL	0.00331	TATA POWER	0.00957
ICICI BANK	0.00284	ACC	0.00944
SUN PHARMA	0.00248	GRASIM	0.00935
ONGL	0.00217	RELIANCE	0.00922
HDFC	0.00192	SBIN	0.00919
JINDAL	0.00173	PNB	0.00856
RANBAXY	0.00140	UNITECH	0.00822
HCL	0.00089	HDFC	0.00818
HDFC BANK	0.00066	RELCAPITEL	0.00792
UNITECH	0.00063	BHEL	0.00777
SIEMENS	0.00043	SIEMENS	0.00696
WIPRO	0.00039	HDFC BANK	0.00685
RELCAPITEL	0.00019	TATA MOTORS	0.00616
PNB	-0.00029	GAIL	0.00578
INFOSYS	-0.00051	ONGL	0.00552
ITC	-0.00055	WIPRO	0.00532
GRASIM	-0.00088	ITC	0.00476
CIPLA	-0.00095	M & M	0.00470
ABB	-0.00126	RANBAXY	0.00465
MARUTI	-0.00225	HERO HONDA	0.00429
M & M	-0.00278	ICICI BANK	0.00419
TATA MOTORS	-0.00285	MARUTI	0.00401
ACC	-0.00338	INFOSYS	0.00353
SBIN	-0.00471	SUN PHARMA	-0.00048
HERO HONDA	-0.00479	CIPLA	-0.00276

Source: Computed from data source   *Source:* Computed from data source

Table 13 Returns in Formation Period for 29 companies (Jul 2009)		Table 14 Returns in Formation Period for 29 companies (Oct 2009)	
Company	*Average Return*	*Company*	*Average Return*
JINDAL	0.00916	JINDAL	0.04286
SAIL	0.00805	SIEMENS	0.01919
ACC	0.00634	TATA POWER	0.01705
BHEL	0.00619	BHEL	0.01378
GRASIM	0.00592	SAIL	0.01277
RELIANCE	0.00573	ONGL	0.01122
ITC	0.00525	UNITECH	0.00988
TATA POWER	0.00473	RELIANCE	0.00984
GAIL	0.00449	RELCAPITEL	0.00962
MARUTI	0.00447	ABB	0.00937
RELCAPITEL	0.00440	ICICI BANK	0.00868
UNITECH	0.00393	HDFC BANK	0.00801
RANBAXY	0.00350	WIPRO	0.00542
SBIN	0.00301	SBIN	0.00497
HDFC BANK	0.00234	HDFC	0.00485
ABB	0.00186	MARUTI	0.00452
TATA MOTORS	0.00142	SUN PHARMA	0.00427
ONGL	0.00130	HCL	0.00312
INFOSYS	0.00091	GAIL	0.00220
M & M	0.00007	GRASIM	0.00171
HDFC	-0.00010	M & M	-0.00001
PNB	-0.00089	HERO HONDA	-0.00044
HERO HONDA	-0.00103	TATA MOTORS	-0.00067
ICICI BANK	-0.00106	PNB	-0.00082
WIPRO	-0.00133	INFOSYS	-0.00144
HCL	-0.00320	RANBAXY	-0.00158
SIEMENS	-0.00348	ITC	-0.00162
CIPLA	-0.00433	CIPLA	-0.00223
SUN PHARMA	-0.00511	ACC	-0.00456

Source: Computed from data source   *Source:* Computed from data source

Table 15 Returns in Formation Period for 29 companies (Jan 2010)		Table 16 Returns in Formation Period for 29 companies (Apr 2010)	
Company	*Average Return*	*Company*	*Average Return*
HERO HONDA	0.00023	Company	Average Return
PNB	-0.00068	RELCAPITEL	0.01193
HDFC	-0.00092	INFOSYS	0.01145
SUN PHARMA	-0.00180	HERO HONDA	0.01027
ICICI BANK	-0.00218	SUN PHARMA	0.01012
TATA MOTORS	-0.00347	WIPRO	0.00994
HDFC BANK	-0.00382	JINDAL	0.00973
SBIN	-0.00387	HDFC	0.00944
ITC	-0.00410	TATA POWER	0.00939
CIPLA	-0.00444	HCL	0.00887
RELIANCE	-0.00550	HDFC BANK	0.00845
SIEMENS	-0.00580	ICICI BANK	0.00824
INFOSYS	-0.00658	UNITECH	0.00664
MARUTI	-0.00664	RELIANCE	0.00591
TATA POWER	-0.00670	PNB	0.00536
RANBAXY	-0.00839	SBIN	0.00491
WIPRO	-0.00870	RANBAXY	0.00426
ONGL	-0.00958	SAIL	0.00354
BHEL	-0.00970	TATA MOTORS	0.00307
UNITECH	-0.01024	ITC	0.00246
GRASIM	-0.01045	GAIL	0.00236
SAIL	-0.01052	M & M	0.00183
M & M	-0.01124	ONGL	0.00135
GAIL	-0.01196	BHEL	0.00075
HCL	-0.01229	CIPLA	-0.00161
ACC	-0.01247	ABB	-0.00239
RELCAPITEL	-0.01261	SIEMENS	-0.00302
ABB	-0.01306	GRASIM	-0.00396
JINDAL	-0.03562	ACC	-0.00421

Source: Computed from data source   *Source:* Computed from data source

Table 17	
Returns in Formation Period for 29 companies (Jul 2010)	
Company	*Average Return*
RELCAPITEL	0.02152
SIEMENS	0.02116
SBIN	0.01856
PNB	0.01564
HDFC	0.01385
JINDAL	0.01309
BHEL	0.01276
ONGL	0.01087
GAIL	0.00841
HDFC BANK	0.00768
M & M	0.00758
HERO HONDA	0.00746
ACC	0.00666
RELIANCE	0.00594
TATA POWER	0.00593
ICICI BANK	0.00571
UNITECH	0.00352
CIPLA	0.00317
SAIL	0.00310
ABB	0.00277
WIPRO	0.00266
GRASIM	0.00229
SUN PHARMA	0.00210
RANBAXY	0.00187
ITC	0.00156
MARUTI	0.00011
TATA MOTORS	-0.00082
INFOSYS	-0.00152
HCL	-0.00960

Source: Computed from data source

Table 18	
Returns in Formation Period for 29 companies (Oct 2010)	
Company	*Average Return*
INFOSYS	-0.00125
HCL	-0.00676
PNB	-0.00745
HERO HONDA	-0.00783
BHEL	-0.00914
HDFC	-0.00950
MARUTI	-0.01044
WIPRO	-0.01063
ITC	-0.01071
HDFC BANK	-0.01103
ACC	-0.01177
M & M	-0.01195
ICICI BANK	-0.01255
SUN PHARMA	-0.01276
CIPLA	-0.01333
SBIN	-0.01434
TATA POWER	-0.01436
RELIANCE	-0.01442
ABB	-0.01759
SAIL	-0.01784
RANBAXY	-0.01850
SIEMENS	-0.01991
ONGL	-0.02197
JINDAL	-0.02255
RELCAPITEL	-0.02654
GRASIM	-0.02700
GAIL	-0.02869
UNITECH	-0.02934
TATA MOTORS	-0.03334

Source: Computed from data source

Table 19 Returns in Formation Period for 29 companies (Jan 2011)		Table 20 Returns in Formation Period for 29 companies (Apr 2011)	
Company	*Average Return*	*Company*	*Average Return*
JINDAL	0.01425	JINDAL	0.02221
GRASIM	0.00982	TATA MOTORS	0.02158
RANBAXY	0.00879	ICICI BANK	0.02103
PNB	0.00682	RELCAPITEL	0.02065
RELIANCE	0.00560	WIPRO	0.01776
ICICI BANK	0.00503	HCL	0.01724
TATA MOTORS	0.00492	M & M	0.01407
SBIN	0.00486	UNITECH	0.01333
HERO HONDA	0.00468	SIEMENS	0.01191
ACC	0.00314	SUN PHARMA	0.01177
TATA POWER	0.00237	SBIN	0.01136
SAIL	0.00227	PNB	0.01104
ITC	0.00220	HDFC	0.00920
GAIL	0.00166	GRASIM	0.00916
CIPLA	0.00155	ABB	0.00902
SIEMENS	0.00096	RELIANCE	0.00866
BHEL	0.00077	HERO HONDA	0.00832
HDFC BANK	-0.00205	TATA POWER	0.00815
UNITECH	-0.00270	BHEL	0.00798
HDFC	-0.00293	SAIL	0.00791
ABB	-0.00298	ACC	0.00713
WIPRO	-0.00376	CIPLA	0.00645
RELCAPITEL	-0.00476	HDFC BANK	0.00623
ONGL	-0.00502	INFOSYS	0.00619
INFOSYS	-0.00571	ONGL	0.00496
SUN PHARMA	-0.00576	GAIL	0.00218
MARUTI	-0.00702	MARUTI	0.00203
M & M	-0.01394	ITC	0.00177
HCL	-0.01440	RANBAXY	-0.00406

Source: Computed from data source   *Source:* Computed from data source

Table 21
Winner Portfolio Returns from February 2006 to March 2006

Date	TATAP	MARUTI	TATAM	GRASIM	PNB	SBIN	M & M	Average	Index Return
17-Feb-04	0.00292	-0.01636	-0.00152	0.04217	0.01855	0.00595	0.01070	0.00892	0.00342
18-Feb-04	-0.00619	0.01419	0.00751	-0.00959	-0.02723	-0.00702	0.01965	-0.00124	-0.00190
19-Feb-04	-0.04502	-0.03512	-0.03496	-0.03695	-0.03915	-0.04051	-0.02526	-0.03671	-0.03034
20-Feb-04	-0.00839	0.02490	0.01526	0.00975	0.00216	-0.00240	0.00492	0.00660	-0.00304
23-Feb-04	-0.02041	-0.03434	-0.04555	-0.04489	-0.06127	-0.02216	-0.02610	-0.03639	-0.02399
24-Feb-04	0.01508	0.01243	-0.00190	-0.01088	0.02573	0.02818	0.01476	0.01191	0.00727
25-Feb-04	-0.02714	-0.02585	-0.05324	-0.01479	-0.01611	-0.02897	-0.02940	-0.02793	-0.01897
26-Feb-04	-0.03234	0.01547	-0.00301	-0.00587	-0.02094	-0.02040	-0.04910	-0.01660	-0.01175
27-Feb-04	-0.00459	0.00898	0.02498	0.00953	0.02689	0.01440	0.03890	0.01701	0.01954
Average								-0.00827	-0.00664

Source: Computed from data source

Table 22
Winner Portfolio Returns from February 2006 to March 2006

Date	TATAP	MARUTI	TATAM	GRASIM	PNB	SBIN	M & M	Average	Index Return
01-Mar-04	0.04208	0.02900	0.02781	0.06368	0.02825	0.02695	0.02098	0.03411	0.02911
03-Mar-04	0.02351	0.02867	0.02686	0.01094	-0.00140	-0.00167	0.02993	0.01669	0.00416
04-Mar-04	0.01486	-0.01493	-0.02905	0.00704	0.01888	0.00876	-0.00358	0.00028	-0.00890
05-Mar-04	0.05286	0.01554	0.02225	0.02215	-0.00828	0.01977	0.01376	0.01972	0.01293
08-Mar-04	0.02516	-0.00878	0.00281	0.03561	0.05624	0.01809	0.00203	0.01874	0.00940
09-Mar-04	-0.01493	-0.01572	-0.02638	-0.03838	0.02051	0.00964	-0.00768	-0.01042	-0.01018
10-Mar-04	0.01415	-0.01432	-0.03122	-0.02765	-0.03042	-0.02541	-0.01171	-0.01808	-0.01163
11-Mar-04	-0.02124	-0.00776	-0.03501	-0.03171	0.01065	-0.02526	-0.03525	-0.02080	-0.02112
12-Mar-04	-0.00341	0.00356	0.00565	-0.01473	0.03029	-0.00465	0.02479	0.00593	0.00377
15-Mar-04	-0.07051	-0.04585	-0.03934	-0.02396	-0.04036	-0.03396	-0.03513	-0.04130	-0.02693
16-Mar-04	-0.00191	-0.01178	-0.02383	-0.02520	-0.00381	-0.01045	0.00011	-0.01098	-0.00797
Average								-0.00056	-0.00249

Source: Computed from data source

Table 23
Winner Portfolio Returns from February 2006 to March 2006

Date	TATAP	MARUTI	TATAM	GRASIM	PNB	SBIN	M & M	Average	Index Return
17-Mar-04	0.01419	0.01109	0.01842	-0.01480	0.06476	0.01266	-0.00303	0.01475	0.00029
18-Mar-04	-0.03054	-0.00590	-0.03263	-0.00263	0.01292	-0.03241	-0.02406	-0.01647	-0.01897
19-Mar-04	-0.00222	-0.01831	0.01051	-0.00396	0.02161	0.01123	0.00255	0.00306	0.00492
22-Mar-04	-0.04757	-0.06031	-0.04849	-0.01640	-0.02653	-0.02943	-0.06789	-0.04237	-0.02325
23-Mar-04	0.00073	0.01218	-0.00656	0.02371	-0.00232	0.00472	0.01723	0.00710	0.00677
24-Mar-04	0.00817	0.00345	0.01494	-0.01029	0.03356	-0.01120	0.01740	0.00800	-0.00253
25-Mar-04	0.03445	0.06230	0.02556	-0.01468	0.05527	0.02997	0.01125	0.02916	0.00730
26-Mar-04	0.03512	0.02321	0.03760	0.04435	0.08773	0.05225	0.05506	0.04790	0.02526
29-Mar-04	0.04366	0.00685	0.01415	0.00694	-0.00481	0.02563	-0.00172	0.01296	0.00833
30-Mar-04	-0.03277	-0.02912	-0.00729	-0.01588	0.05640	-0.02598	-0.01832	-0.01042	-0.00675
31-Mar-04	0.01004	0.03982	0.03482	0.03208	-0.04294	0.02262	0.02031	0.01668	0.01243
Average								0.00640	0.00125

Source: Computed from data